CLAIMS:

1. A geogrid comprising transverse bars interconnected by substantially straight oriented strands, at least some of the strands extending from one bar to the next at a substantial angle to the direction at right angles to the bars and alternate such angled strands across the width of the geogrid being angled to said direction by equal and opposite angles.

2. The geogrid of Claim 1, wherein there are no strands interconnecting the bars and which extend in a direction at right angles to the bars.

3. The geogrid of Claim 2, wherein the strands of each pair of adjacent angled strands meet immediately adjacent the respective bar.

4. The geogrid of Claim 1, wherein between the locations where the strands meet the bar, the bar is unoriented, and at the locations where the strands meet the bar, the bar is slightly oriented in a direction at right angles to the bars so that the orientation of the strands extends across the bar to the respective strands on the other side of the bar.

5. The geogrid of Claim 4, wherein between the locations where the strands meet the bar, the bars have a structure which is similar right across the geogrid.

6. A geogrid comprising at least three sets each of at least three spaced, parallel, effectively rectilinear continuous tensile members which extend through the geogrid and each of which comprises an oriented strand, a junction, an oriented strand, a junction, and so on, each junction interconnecting respective strands of the tensile member and the strands of the tensile member being substantially aligned with each other, the tensile members of each set making an angle with the tensile members of the other sets, and the junctions of one set also functioning as the junctions of at least one of the other sets, mesh openings being defined by the tensile members.

7. The geogrid of Claim 6, wherein each said junction functions as a junction for a tensile member of each of said sets, whereby a said tensile member of each of the sets intersects at the junction.

8. A geogrid comprising three sets of continuous tensile members which extend through the geogrid and each of which comprises an oriented strand, a junction, an oriented strand, a junction, and so on, each junction interconnecting respective strands of the tensile member, the tensile members of each set making an angle with the tensile members of the other sets and the junctions of one set also functioning as the junctions of both other sets whereby six strands are interconnected by each junction and triangular mesh openings are defined by the tensile members.

9. The geogrid of Claim 8, and comprising strands and junctions at substantially each of which six of the strands meet, substantially each strand having each end connected to such a junction, whereby groups of three strands form triangular meshes with a junction at each corner.

10. The geogrid of Claim 8, wherein one set of tensile members is substantially in the transverse direction.

11. The geogrid of Claim 6, wherein said angle is substantially 60°.

12. A biaxially-oriented plastics material geogrid, comprising:

substantially straight oriented strands extending at an acute angle to a first direction;

further substantially straight oriented strands extending in a second direction at right angles to the first direction; and

junctions each interconnecting four of the first-mentioned (angled) oriented strands and two of the further oriented strands;

as considered in the second direction, alternate angled strands being angled to the first direction by substantially equal and opposite angles.

13. The geogrid of Claim 12, wherein there are no oriented strands which extend substantially in the first direction.

14. The geogrid of Claim 12, wherein the junctions comprise two thicker zones each connecting two angled strands and a further strand, and a thinner zone interconnecting the two thicker zones.

15. The geogrid of Claim 12, wherein the angle between the axis of each angled strand and the first direction is between about 10° and about 20°.

16. The geogrid of Claim 12, wherein the angle between the axis of each angled strand and the first direction is about 30°.

17. A method of making a uniaxially oriented plastics material geogrid, comprising:

providing a plastics sheet starting material which has holes in an array of hexagons of substantially identical shape and size so that substantially each hole is at a corner of each of three hexagons, there being within the hexagon no holes of a size greater than or equal to the size of the first mentioned holes; and

applying a stretch to stretch out strand-forming zones between adjacent holes on sides of the hexagons and form oriented strands from such zones, thereby forming a structure having bars at right angles to the direction of stretch, interconnected by the oriented strands.

18. A method of making a biaxially oriented plastics material geogrid, comprising:

providing a plastics sheet starting material which has holes in an array of hexagons of substantially identical shape and size so that substantially each hole is at a corner of each of three hexagons, there being within the hexagon no holes of a size greater than or equal to the size of the first-mentioned holes;

applying a stretch in a first direction to stretch out strand-forming zones between adjacent holes on sides of the hexagons and form oriented strands from such zones; and

applying a stretch in a second direction substantially at right angles to said

first direction to stretch out strand-forming zones between adjacent holes on the sides of the hexagons and form oriented strands from the latter zones, whereby centre portions of the hexagons form junctions interconnecting the oriented strands.

19. The method of Claim 18, wherein the stretch in the first direction is applied in a direction substantially parallel to two sides of the hexagons, to stretch out zones between adjacent holes on the remaining four sides of the hexagons, and the stretch in the second direction stretches out zones between adjacent holes on the sides parallel to the first direction.

20. The method of Claim 18, wherein each hexagon is substantially symmetrical about an axis which extends in said direction of stretch or in said first direction.

21. The method of Claim 18, wherein each hexagon is arranged so that two opposite holes delineating the hexagon are substantially aligned in the said direction of stretch or in said first direction, and the stretch in said direction of stretch or in said first direction is applied in a direction substantially parallel to two sides of the hexagons, to stretch out zones between adjacent holes on the remaining four sides of the hexagons.

22. The method of Claim 18, wherein the sides of the hexagons are all substantially equal, as measured between the centres of the respective holes.

23. The method of Claim 18, wherein the MD vertex pitch of each hexagon is less than the diagonal pitch.

24. The method of Claim 23, wherein the ratio of the major MD pitch of the hexagon to the minor MD pitch of the hexagon is about 2.1:1 to about 3.2:1.

25. The method of Claim 23, wherein the ratio of the major MD pitch of the hexagon to the minor MD pitch of the hexagon is about 2.6:1.

26. The method of Claim 23, wherein said stretch in said second direction is not before said stretch in said first direction, and during said stretch in said second

direction, restraint is applied to the material in said first direction, and after the second stretch, before the material is allowed to relax in the said second direction, said restraint is discontinued.

27. A method of making a plastics material mesh structure, comprising:

providing a plastics sheet starting material which has holes in a regular pattern, which holes define potential strand-forming zones extending between respective holes and which on stretching the starting material in one direction would stretch out to form oriented strands;

forming depressions in and thereby weakening some but not all said potential strand-forming zones without material removal when the plastics material is at a temperature below the lower limit of its melting range, said depressions defining a regular pattern; and

applying a stretch in said direction so that the weakened potential strand-forming zones form oriented strands but the non-weakened potential strand-forming zones do not form oriented strands though some stretch may be applied thereto and whereby the mesh structure so produced is not that that would be produced from the starting material without said depressions.

28. The method of Claim 27, wherein the starting material is also stretched in a direction at right angles to said one direction, to form oriented strands from further respective potential strand-forming zones.

29. The method of Claim 28, wherein no said depressions are formed in the respective potential strand-forming zones for the second-mentioned direction stretch, whereby said ungrooved potential strand-forming zones related to stretching in said one direction form extended junctions between said oriented strands.

30. The method of Claim 28, wherein stretching in said one direction is the second stretch, following stretching in said second-mentioned direction.

31. The method of Claim 28, wherein in said one direction, said depressions are formed in every other potential strand-forming zone.

32. A method of making an oriented plastics material geogrid, comprising:

providing a plastics sheet starting material which has holes on a rectangular grid whose axes extend in a first direction and in a second direction substantially at right angles to the first direction, thereby providing first rows of holes extending in the first direction and second rows of holes extending in the second direction, and which starting material has weakened zones between alternate pairs of adjacent holes in each first row, the weakened zones being staggered as between adjacent first rows so that a weakened zone in one first row is adjacent a non-weakened zone in the adjacent first row on either side;

applying a stretch in the first direction to stretch out strand-forming zones between adjacent holes in each second row to form oriented strands from such zones; and

applying a stretch in the second direction to stretch out the weakened zones to form oriented strands from the weakened zones without stretching out non-weakened zones between adjacent holes of the first rows to the same extent as the weakened zones are stretched;

whereby the non-weakened zones form junctions each of which interconnects six of the oriented strands.

33. The method of Claim 18, wherein there are strands which extend in said second direction or said one direction and which are stretched out to a lower stretch ratio than the other strands.

34. A method of making biaxially oriented plastics material mesh structure which has oriented strands which extend at an angle other than 90° to the first and second direction of stretch, comprising:

providing a plastics sheet starting material which has holes in a regular array;

applying a stretch in a first direction to stretch out respective strand-forming zones between adjacent holes and form oriented strands from such strand-forming zones;

applying a stretch in a second direction substantially at right angles to said first direction to stretch out other respective strand-forming zones between adjacent holes

and form further oriented strands from the latter strand-forming zones, whilst applying restraint to the material in the first direction;
subsequently discontinuing said restraint; and
subsequently allowing the material to relax in the second direction.

35. A geogrid made by the method of Claim 17.

36. A geogrid made by the method of Claim 18.

37. A mesh structure made by the method of Claim 34.

38. A method of strengthening a particulate material, comprising embedding in the particulate material the geogrid of Claim 1.

39. A method of strengthening a particulate material, comprising embedding in the particulate material the geogrid of Claim 6.

40. A method of strengthening a particulate material, comprising embedding in the particulate material the geogrid of Claim 12.

41. A geoengineering construction comprising a mass of particulate material strengthened by embedding therein a geogrid as claimed in Claim 1.

42. A geoengineering construction comprising a mass of particulate material strengthened by embedding therein a geogrid as claimed in Claim 6.

43. A geoengineering construction comprising a mass of particulate material strengthened by embedding therein a geogrid as claimed in Claim 12.